

Strategic Skills Initiative

—Summary Report—



*Occupational
&
Skills Shortages*

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INDIANA
WORKFORCE
DEVELOPMENT

Prepared By: Indiana Workforce Development, Research and Analysis Division

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Statewide Summary

Key Industries: Health Care & Social Services; Manufacturing; Transportation, Distribution & Logistics; Professional, Technical & Business Services

Indexed Occupational Shortages and Wages, Statewide Summary:

SOC Code	Occupational Title	Regions with Shortage	Total Regions with Shortage	Estimated 2007 Shortage	Statewide OES Wage
Health Care & Social Assistance	Registered Nurses	1,2,3,5,6,8,9,10,11	9	1735	\$46,903
Manufacturing	Welders, Cutters, Solderers, and Brazers	1,2,5,10	4	525	\$32,065
Manufacturing	Machinists (Metal & Plastic)	3,4,5,10	4	443	\$35,883
Retail Trade	Pharmacists	1,10	2	122	\$80,664
Transportation & Warehousing	Supv, Transportation Wkrs	1,5	2	280	\$47,792
Manufacturing	Supv, Production and Operating Wkrs	1,2,4,8,10	5	280	\$47,428
Manufacturing	Maintenance & Repairer Workers; General	3,4,7,11	4	344	\$32,819
Manufacturing	Computer-controlled Machine Tool Operators	2,3,4,5,6	5	328	\$31,828
Transportation & Warehousing	Truck Drivers, Heavy Tractor-Trailer	5,6,10	3	294	\$36,153
Manufacturing	Industrial Maintenance Technicians	3,4,10,11	4	244	\$43,820
Wholesale Trade	Sales Reps, Wholesale & Manufacturing	1	1	200	\$49,815
Manufacturing	Maintenance Workers: Machinery	3,4,7,11	4	198	\$37,405
Manufacturing	Team Assemblers	8	1	234	\$30,069
Retail Trade	Electrical & Electronics Engineering Techs	8	1	134	\$44,962
Retail Trade	Supv, Mechanics, Installers & Repairers	4,7	2	76	\$49,820
Health Care & Social Assistance	Licensed Practical Nurses	5,6,8,9,10,11	6	125	\$33,800
Manufacturing	Inspectors, Testers, Sorters, Samplers	1,5,10	3	129	\$32,312
Health Care & Social Assistance	Respiratory Therapist	2,7,8,10	4	76	\$41,505
Health Care & Social Assistance	Radiological Technicians	7,10	2	26	\$41,149

Key Emerging Industries/Occupations:

- Agri-business/Agri-science: Recognized as emerging industry in Regions 4 & 6. Alternative fuel discovery and production (Region 6) and Agri-science development and production (Region 4) were key industries seen as emerging in near future.
- Professional, Scientific, & Technical Services: Region 8 selected this as a key industry in direct relation to anticipated activity occurring around Crane.
- Hospitality: Region 8 selected as "emerging" or opportunistic industry as development of Orange County area will lead such growth.
- Nano Manufacturing Specialists/Micro-bedded Systems Specialists, Geographical Information (GIS) Systems Technicians, Fiber Optics Techs: Region 9 identified several emerging occupations- those expected to be needed over the next 3-5 years. Most are non-existent today, but represent tomorrow's economy.
- Electrical and Electronic Engineering Technicians: Region 8 identified as key occupation primarily as a result of expected development around Crane. 2007 shortage est. = 134
- Chemical Manufacturing/Technicians: Identified in Regions 5, 7, and 9 as an emerging industry/occupation with expected growth in bio-fuel production in Indiana.
- CNC-MIMM: Emerging "hybrid" occupation identified in Region 3 through employer forums and research. Combination of CNC operators and industrial machinery mechanics and maintenance technicians. 2007 shortage est. = 490

Critical Skills For Top & Emerging Occupations with Associated Wage

Top Skill Shortages and Associated Wages by Region

	Active Learning	Active Listening	Critical Thinking	Complex Prob. Solv	Coordinat	Judgment Dec. Makin	Operation & Control	Reading Comprehe	Science	Speaking	Systems Evaluation	Technol. Design	Time Mgmt.	Trouble-shooting	Mathe-Matics
Region 1	\$48,493	\$32,887	\$45,509		\$43,347			\$39,654	\$52,104	\$37,181					\$35,803
Region 2			\$46,929		\$44,733		\$29,676	\$41,310		\$39,460			\$40,958		
Region 3	\$49,895	\$34,148	\$46,306	\$54,672	\$43,726	\$54,916		\$40,282					\$40,391	\$39,892	
Region 4			\$45,849			\$53,377	\$45,764								\$34,277
Region 5	\$53,538			\$59,377	\$47,136	\$60,294	\$29,676			\$41,226		\$59,200	\$43,586		\$39,448
Region 6				\$49,442		\$51,080					\$86,257				\$32,280
Region 7	\$45,551	\$30,120	\$42,550		\$39,091			\$36,471					\$36,969	\$36,062	
Region 8		\$31,436	\$44,225		\$41,326			\$38,631		\$35,044			\$38,062	\$42,914	
Region 9	\$51,256	\$33,862	\$46,657		\$43,879	\$56,508		\$40,176	\$50,957	\$38,367			\$39,615		
Region 10	\$47,503		\$44,328	\$52,874	\$42,188		\$28,924	\$37,836	\$59,291	\$36,503			\$37,854		\$33,287
Region 11	\$48,545	\$33,092	\$45,309		\$43,005	\$53,232		\$39,290	\$47,761	\$37,731			\$39,654	\$38,362	

(critical overlapping skills for Region's Top 5 shortage occupations OR skills critical to at least 4-5 of the region's shortage occupations)

Significance/Impact:

- **Key point:** Occupations cluster around key/critical skills, thus the transfer of those skills assists in creating "emerging" occupations within both existing and emerging industries. Skills for Market Research Analyst (quantitative abilities, mathematical reasoning, complex problem solving) are consistent across pharmaceutical, automotive, specialty toiletry supply manufacturing industries; however, only final industry would classify this as an "emerging" occupation, as these skills have only recently been required to keep firms competitive within that industry.
- Key skills in shortage throughout the state: Critical Thinking, Complex Problem Solving, Science, Mathematics, Reading Comprehension, and Active (Lifelong) Learning.
- Skill (\$) values display little variation across regions suggesting consistent value or expectation of competency level across multiple occupations.
- Many of the skills required for tomorrow's jobs are categorized today; they will simply evolve, morph, and cluster to support the competitive requirements of the market.

SSI Occupational & Skill Shortage Take-Aways:

- Manufacturing occupations (of some sort) were selected by virtually every region. Two key factors drove this: Pending replacement needs of baby boomers and need for firms to competitively adapt their processes to the demands of the marketplace.
- Aforementioned trends in manufacturing will impact supervisory/managerial roles and process engineers/technicians most severely.
- Emerging industries within manufacturing are centered around bio/life sciences disciplines and are those occupations that will drive economic growth in Indiana.
- Although health care service industry does not drive or lead economic growth, shortages consistent with broader demographic trends will continue to persist. Primarily in areas of Registered Nurses, Pharmacists, Respiratory Therapists, & Radiological Technicians.
- Skills supporting the emergence of new industries and occupations are those that must be addressed to prepare our emerging workers while "retooling" our existing workforce.



Economic Growth Regions



Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 1

Excerpts from Shortage Report

- Almost 26% of region's wage & salary payroll comes from Manufacturing
- Only two-thirds of the jobs lost during the recent recession have been recovered
- Average age of the regional workforce has increased more rapidly (1990-2000) than either the state or the nation – 1.49 yrs. for NW IN; 1.30 yrs. for IN overall; 0.96 yrs. for the U.S. -- creating a strong demand for replacement workers even in industries with level employment
- Work ethic issues were a frequent complaint of employers across all industries

Key Industries: Health Care & Social Services, Manufacturing, Transportation, Distribution & Logistics

Key Occupations (based on top 5 shortage projections):

Registered Nurses: Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

Welders, Cutters, Solderers and Brazers: Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

Sales Representatives, Wholesale and Manufacturing: Sell goods for wholesalers or manufacturers to businesses or groups of individuals. Work requires substantial knowledge of items sold.

Pharmacists: Compound and dispense medications following prescriptions issued by physicians, dentists, or other authorized medical practitioners.

Pharmacy Technicians: Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 - 2007
Registered Nurses	250
Welders, Cutters, Solderers, and Brazers	207
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	200
Pharmacists	98
Pharmacist Technicians	63

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

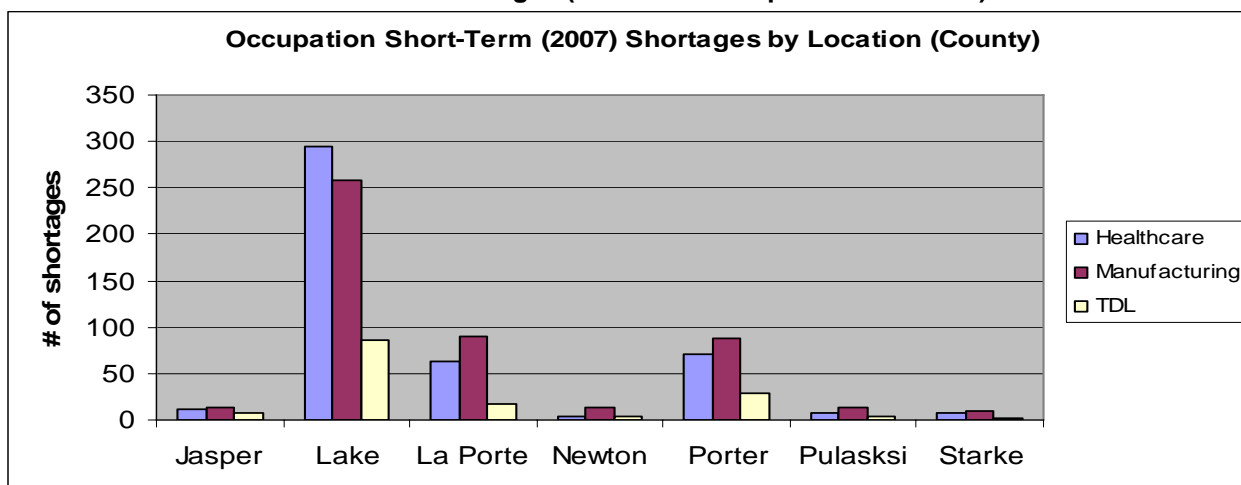
Service Orientation — Actively looking for ways to help people.

Social Perceptiveness — Being aware of others' reactions and understanding why they react as they do.

Overlapping Critical Skills For Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Registered Nurses	Sales Reps Whsl & Mfg	Pharmacists	Pharmacy Technicians
Science	\$52,104				
Active Learning	\$48,493				
Critical Thinking	\$45,509				
Reading Comprehension	\$39,654				
Social Perceptiveness	\$39,619				
Instructing	\$39,179				
Speaking	\$37,181				
Service Orientation	\$35,975				
Mathematics	\$35,083				
Active Listening	\$32,887				
Considered a Critical Skill for this occupation					

Location of Shortages (all critical occupations included)



Emerging Industries

- Biotech and Life Science Industries

Significance/Impact:

- Physical capital investment opportunities are diminished due to relocating facilities and/or outsourcing non-core functions outside of EGR-1 or postponing expansion due to critical skills shortages
- Skills deficiencies create barriers to educational attainment and full employment, the drivers of income growth

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 2

Excerpts from Shortage Report

- High-skill jobs in demand do not necessarily require associate or bachelor's degrees, and college graduates have not necessarily been trained in highly marketable skills and may find themselves underemployed.
- Focus of this region's SSI effort is on occupations that require less formal training than a bachelor's degree, but offer good upward mobility, as most appropriate and amenable to intervention through this initiative.

Key Industries: Health Care (Ambulatory Health Care Services/Hospitals) and Manufacturing (Transportation Equipment, Fabricated Metal Products, Plastics & Rubber Products, Machinery and Miscellaneous (Medical Equipment) Manufacturing)

- 3-digit sub-sectors selected based on cluster analysis/connectedness to dominant industry (e.g. Transportation Equipment), proportion of "good" jobs (paying \$12.60/hr or more in 2000) and industry concentration as defined by location quotients among other factors.
- Transportation Equipment Manufacturing (especially Recreation Vehicle Manufacturing) accounts for over 36% of all Manufacturing employment in the Region.
- Medical Device Manufacturing, concentrated in Warsaw, pays the highest wages (\$1,244/week) of any of the targeted industries and has experienced explosive growth (over 29% between 1994 and 2004).

Key Occupations (based on top 5 shortage projections):

Registered Nurses: Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

First-Line Supervisors of Production and Operating Workers: Supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.

Welders, Cutters, Solderers and Brazers: Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

Computer-Controlled Machine Tool Operators: Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.

Painters, Transportation Equipment: Operate or tend painting machines to paint surfaces of transportation equipment, such as automobiles, buses, trucks, trains, boats, and airplanes.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Registered Nurses	174
Front-Line Supervisors	160
Welders, Cutters, Solderers, Brazers	158
Computer-Controlled Machine Tool Operators	76
Painters, Transportation Equipment	65

Selected Skills Definitions

Coordination — Adjusting actions in relation to others' actions.

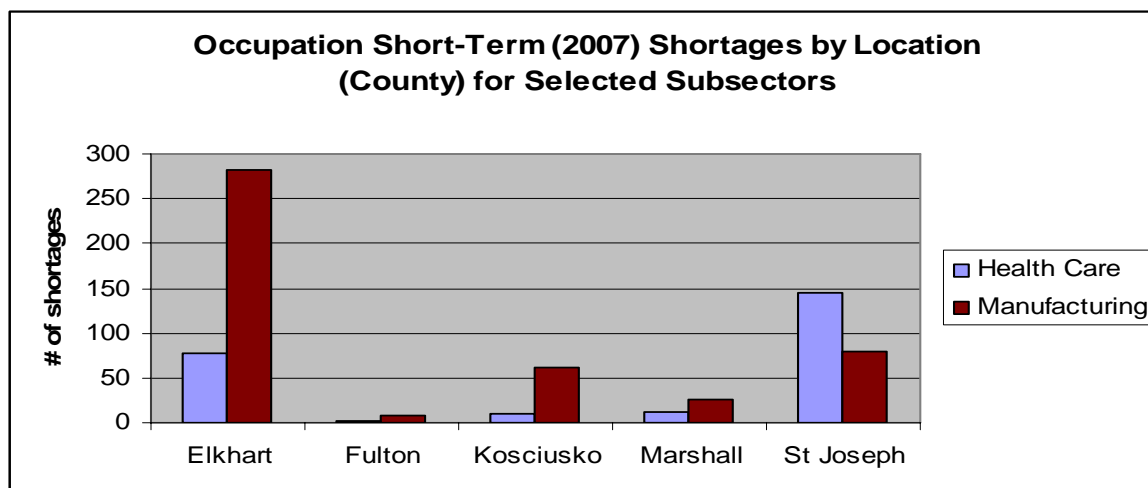
Equipment Selection — Determining the kind of tools and equipment needed to do a job.

Operation and Control — Controlling operations of equipment or systems.

Overlapping Critical Skills For Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Reg. Nurses	1st-Line Superv.	Welders, Cutters	Mach Oper.	Painters
Critical Thinking	\$46,929					
Coordination	\$44,733					
Reading Comprehension	\$41,310					
Time Management	\$40,958					
Speaking	\$39,460					
Equipment Selection	\$35,571					
Operation and Control	\$29,676					
Considered a Critical Skill for this occupation						

Location of Shortages (all critical occupations included)



Emerging Occupations

- Cytogenetic technologists
- Orthotists
- Orthopedic cast technologists
- Biostatisticians

Significance/Impact:

- Skills gaps lead to rising costs, profitability declines and diminished competitiveness.
- Industry strategies to compensate for occupational/skills shortages include increased use of overtime, outsourcing, automation, in-house training.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 3

Excerpts from Shortage Report

- The vast majority of current employment growth is taking place in service sector industries where wages struggle to keep pace with self-sufficiency levels.
- The health care delivery network is growing and generating some wealth for the region from beyond their borders...but it is facing a critical shortage of registered nurses.

Key Industries: Health Care Delivery (Ambulatory Health Care & Hospitals); Advanced Manufacturing (Plastics & Rubber Products, Primary Metal Manufacturing, Fabricated Metal Product Manufacturing, Machinery Manufacturing, Transportation Equipment Manufacturing)

Key Occupations (based on top 5 shortage projections):

Registered Nurses: Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

Computer Systems Analysts -- Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. May supervise computer programmers.

Industrial Engineers --Design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

(Note that the following occupations were condensed in creating the hybrid occupation referred to as CNC-MIMM: CNC-Operators, Machinists, Industrial Machinery Mechanics and Maintenance)

Computer-Controlled Machine Tool Operators: Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.

Industrial Machinery Mechanics: Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems.

Machinists: Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments.

Maintenance and Repair Workers, General: Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair.

Maintenance Workers, Machinery: Lubricate machinery, change parts, or perform other routine machinery maintenance.

Net Calculation Table – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Computer-Controlled Machine Operators/Machinists/Mechanics	490
Registered Nurses	304
Computer Systems Analysts	158
Industrial Engineers	75

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

Learning Strategies — Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

Monitoring — Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action

Overlapping Critical Skills For Shortage Occupations with Associated Wage

Skill	Assoc. Wage	CMC-MIMM	Registered Nurses	Systems Analysts	Industrial Engineers
Judgment/Decision Making	\$54,916				
Complex Problem Solving	\$54,672				
Active Learning	\$49,895				
Critical Thinking	\$46,306				
Monitoring	\$45,081				
Coordination	\$43,726				
Time Management	\$40,391				
Reading Comprehension	\$40,282				
Troubleshooting	\$39,892				
Learning Strategies	\$39,419				
Equipment Selection	\$37,587				
Service Orientation	\$36,983				
Mathematics	\$35,620				
Quality Control Analysis	\$35,473				
Active Listening	\$34,148				
Operation Monitoring	\$33,281				
Considered a critical skill for this occupation					

Location of Shortages --*Not available/not included*

Emerging Occupations

- CNC-Operators, Machinists, Industrial Machinery Mechanics & Maintenance Workers, as noted above
- Computer Systems Analysts (strong need/demand in various non-IT settings)

Significance/Impact:

- One industry expert stated: "Without these key staff (Registered Nurses), we will ship people out to other facilities for care. We will decrease our level of service, or perhaps close a specific facility if our global shortage is great enough."
- Critical computer skills are key to manufacturing health and growth and are difficult to replace via technology, outsourcing or off-shoring.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 4

Excerpts from Shortage Report

- Advanced Manufacturing firms are 3.7 times more concentrated in EGR 4 than in the nation at large.
- Advanced Materials firms are two times more concentrated regionally than nationally. This cluster shows rapid growth in concentration and is closely linked to Advanced Manufacturing.
- Employers express the need for “flexible manufacturing” or the need to move quickly in responding to market opportunities and adapting to rapid changes in technology.
- Agribusiness, Food Processing and Technology firms are 2.5 times more concentrated than nationally and is vitally important to small communities in this largely rural region. Prospects for future growth are bright, as the manufacture of alternative fuels and the production/processing of hogs are expected to increase.

Key Industries: Advanced Manufacturing, Advanced Materials, Agribusiness, Food Processing and Technology.

- Advanced Manufacturing employed 17% of the region’s workforce and accounted for 32% of total wages paid in 2004.
- Advanced Materials employed 2.5% of the workforce and pays 4.3% of all wages.
- Agribusiness, Food Processing and Technology employs 5.5% of the workforce and pays 6.1% of all wages.

Key Occupations/Occupation Groups (based on top 5 shortage projections):

Material Recording, Scheduling, Dispatching & Distributing Workers: Coordinate and expedite flow of work and materials within or between departments of an establishment according to production schedules. Duties include reviewing and distributing production, work, and shipment schedules.

Supervisors of Installation, Maintenance and Repair Workers: Supervise and coordinate the activities of mechanics, installers and repairers.

Supervisors Production and Operating Workers: Supervises and coordinates the activities of production and operating workers such as inspectors, precision workers, machine setters and operators, assemblers, fabricators and plant and system operators.

Material Moving Workers: Control or tend conveyors or conveyor systems that move materials or products to and from stockpiles, processing stations, depts. or vehicles.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

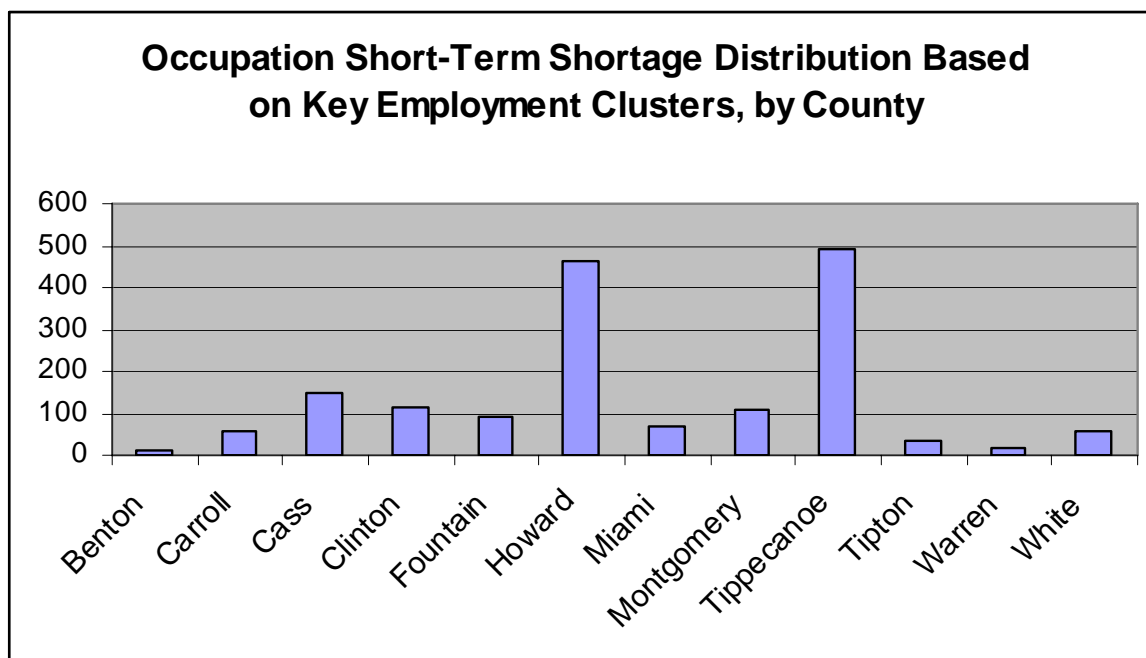
Occupation	Shortage Projection 2005 -2007
Metal & Plastic Workers	660
Material Moving Workers	440
Material Recording, Scheduling, Dispatching & Distributing Workers	270
Other Maintenance and Repair Workers	220
Supervisors, Production and Operating Workers	40

Overlapping Critical Skills for Key Occupations

Foundation Skills	Problem-Solving Skills	Occupation Specific Skills
Reading/Written comprehension	Decision Making	Equipment Maintenance
Evaluating Information	Problem Sensitivity	Equipment Selection
Documenting Information	Deductive Reasoning	Repairing
Communication	Negotiation	Troubleshooting
Information Ordering	Complex Problem Solving	Quality Control
Math	Judgment	Control Precision
Writing	Systems Analysis	Operational Control
Active Listening	Critical Thinking	Management of Resources
	Coordination	Installation
		Visualization

(Since Region 4 focused on occupational groupings, rather than specific occupations, direct linkages to skills are problematic)

Location of Shortages (all critical occupations included)



Emerging Occupations

- Maintenance and Repair Workers
- General/Maintenance Workers
- Machinery

Significance/Impact:

- Many employers expressed concerns that it is becoming increasingly difficult to identify and hire **skilled workers**.
- The competitiveness of the three critical industry clusters rests on the ability of the workforce to be flexible, efficient, and move at rapid speed as business circumstances change and to actively participate in lifelong learning.
- Companies will expand and locate where there is an educated and skilled workforce available.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 5

Excerpts from Shortage Report

- Manufacturing, with 12.3% of total region employment, is the number one industry sector and Health Care, with 11.9 % of total region employment, is the number two industry sector in terms of employment in EGR 5. Manufacturing has held the number one position for several decades, while health care replaced retail trade as the second largest employer in 2003.
- EGR 5 has chosen to focus on occupations that are related to four industry clusters that within the region: Advanced Manufacturing; Health Care & Biotechnology; Logistics; and Automotive & Motor Sports.

Key Industries: Health Care (Ambulatory Health Care Services/Hospitals) and Manufacturing (Transportation Equipment, Fabricated Metal Products, Chemicals, Machinery Manufacturing)

- 3 digit sub-sectors selected based on cluster analysis/connectedness to a dominant industry (e.g. Transportation Equipment), proportion of high wage jobs, and industry concentration as defined by location quotients among other factors.
- Transportation Equipment Manufacturing accounts for over 20% of all Manufacturing employment in the Region.

Key Occupations (based on top 5 shortage projections):

Freight, Stock & Material Mover: Manually move freight, stock or other materials or perform other unskilled general labor.

Truck Driver, Heavy or Tractor-Trailer: Drive a tractor-trailer combination or a truck with a capacity of not less than 26,000 GVW, to transport and deliver goods, livestock, or materials in liquid, loose, or packaged form. May be required to unload truck. May require use of automated routing equipment.

Registered Nurse: Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

Inspector, Tester, Sorter, Sampler, and Weigher: Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

Nurse's Aide, Orderly, and Attendant: provide basic patient care under direction of nursing staff. Perform duties such as feed, bathe, dress, groom, or move patients, or change linens.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Freight, Stock, or Material Mover	4,260
Truck Drivers, Heavy or Tractor-Trailer	3,640
Registered Nurse	2,422
Inspector, Tester, Sorter, Sampler, and Weigher	2,279
Nurse's Aide, Orderly, and Attendant	1,993

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

Coordination — Adjusting actions in relation to others' actions.

Instructing — Teaching others how to do something.

Monitoring — Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

Operation and Control — Controlling operations of equipment or systems.

Speaking — Talking to others to convey information effectively.

Time Management — Managing one's own time and the time of others.

Overlapping Critical Skills for Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Laborers	Truck Drivers	Reg. Nurses	Inspectors	Nurse Aides
Active Learning	\$53,538					
Monitoring	\$49,655					
Coordination	\$47,136					
Time Management	\$43,586					
Speaking	\$41,226					
Instructing	\$41,167					
Operation and Control	\$29,676					
Considered a Critical Skill for this occupation						

Location of Shortages

Not Available/Not Included.

Emerging Occupations

- Industrial Production Technicians
- Allied Health Professionals

Significance/Impact:

- Work-readiness issues are major factor in high turnover rates for many positions, including lower-skill occupations such as freight or material handler.
- Leadership skills are increasingly demanded of workers, who find themselves in management roles such as first-line supervisor or shift charge nurse without previous experience or training to develop these skills; this deficiency exists across all sectors.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 6

Excerpts from Shortage Report

- Overall loss of market share during past 10 years in most key industries and others has hindered economic development efforts in the region.
- Focus of this region's SSI effort is on occupations in the Agriculture and Transportation & Warehousing sectors, where the region is positioned to take advantage of critical pending legislation related to these industries.

Key Industries: Health Care (Ambulatory Health Care Services/Hospitals) and Manufacturing (Transportation Equipment, Fabricated Metal Products, and Computer & Electronic Products Manufacturing); Transportation & Warehousing; and Agriculture

- 3-digit sub-sectors selected based on cluster analysis/connectedness to dominant industry (e.g. Transportation Equipment), proportion of high wage jobs and industry concentration as defined by location quotients among other factors.
- Transportation Equipment Manufacturing accounts for over 30% of all Manufacturing employment in the region.
- Manufacturing, concentrated in Delaware and Wayne counties, pays the highest wages of the targeted industries and yet has experienced the sharpest decline in employment (over 20% between 1994 and 2004) for the region.

Key Occupations/Occupation Groups (based on top 5 shortage projections):

Truck Drivers, Heavy or Tractor-Trailer: Drive a tractor-trailer combination or a truck with a capacity of not less than 26,000 GVW, to transport and deliver goods, livestock, or materials in liquid, loose, or packaged form. May be required to unload truck. May require use of automated routing equipment.

Health Diagnosing and Treating Practitioners: Diagnose, treat, and help prevent diseases, conditions and injuries that commonly occur in the general population.

Health Technologists and Technicians: Conduct tests and perform procedures related to diagnosis, treatment and prevention of diseases, conditions and injuries that commonly occur in the general population.

Business Operations Specialists: Includes human resource professionals, buyers, and other business professionals.

Life Scientists: Includes occupations that are especially important to the agriculture industry, and that focus on the study of plants, animals, and diseases.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Health Diagnosing and Treating Practitioners	213
Health Technologists and Technicians	42
Truck Drivers, Heavy and Tractor-Trailer	11
Business Operations Specialists	11
Life Scientists	(11)*

*given recent emergence of this occupation, sample size is not sufficient for accurate projections. Region relied heavily on qualitative input from Industry/econ dev. for importance of this occupation in the future.

Region 6 chose to identify cross-cutting skills deficiencies that affect a wide range of occupations and that employers have identified as problematic in the current workforce and detrimental to future growth based on community forums and other local discussions

Identified Skills Gaps by County

	Reading/ Comprehension	Computer Literacy	Math/ Science	Problem Solving	Work Ethic	Leader- ship	Communi- cations
Blackford							
Delaware							
Fayette							
Henry							
Jay							
Randolph							
Rush							
Union							
Wayne							
Considered a critical skill for this county							

- Skills identified with Health Services occupations include Science, Social Perceptiveness, Service Orientation, Active Listening
- Complex Problem Solving and Resource Management skills were associated with Business Operations Specialists
- Metal & Plastics Workers require skills such as Equipment Maintenance and Selection, Operation and Control and Operation Monitoring and Analysis, Programming, Quality Control Analysis, Repairing and Troubleshooting
- Truck Drivers' critical skills are considered to include Operation and Control and Equipment Maintenance, as well as good map-reading skills and knowledge of laws and regulations that relate to the industry

Location of Projected Shortages by County – *not included*

Emerging Occupations/Industries:

- Transportation & Warehousing
- Agribusiness
- Life Scientists

Significance/Impact:

- To remain in business, companies' overall workforce must possess the skills required to increase their production and innovation; business operations specialists' expertise will be required to help these companies grow.
- Emphasis on entrepreneurial skills required for business startups as well as product development within existing companies.
- Business productivity and efficiency improvements will be based in part on the competencies of key human resource, logistics and analyst positions (i.e. Business Operations Specialists).

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 7

Excerpts from Shortage Report

- Manufacturing makes up 25% of the EGR 7 private sector employment despite heavy losses in 2001
- Plastics and Rubber Manufacturing has had the greatest job growth since 1994
- Healthcare (NAICS 621) has experienced the highest increase in new businesses since 1994

Key Industries:

- Manufacturing transportation (NAICS 336) chemical (NAICS 325) as well as plastics and rubber manufacturing (NAICS 326)
- Healthcare (NAICS 621 and 622) and Social Services (NAICS 623)
- Trucking and Distribution (NAICS 484)

Key Occupations (based on top 5 shortage projections):

Maintenance Repairer Workers, General: Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.

First-Line Supervisors/Managers of Mechanics: Supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.

Chemical Technicians: Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for purposes, such as research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.

Electrical and Electronics Repairers, Commercial and Industrial Equipment: Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.

Maintenance Workers, Machinery: Lubricate machinery, change parts, or perform other routine machinery maintenance.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 - 2007
Maintenance Repairer Workers, General	79
First-Line Supervisors/Managers of Mechanics	46
Chemical Technician	40
Electrical and Electronic Repairers, Commercial	26
Maintenance Workers, Machinery	22

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving.

Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.

Trouble Shooting — Determining causes of operating errors and deciding what to do about it.

Overlapping Critical Skills For Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Maintenance Repairer	First-Line Supervisors	Chemical Technician	Electrical Repairer	Maintenance Worker-Mach
Active Learning	\$45,551					
Critical Thinking	\$42,550					
Coordination	\$39,091					
Equipment						
Maintenance	\$30,093					
Equipment Selection	\$34,550					
Installation	\$34,020					
Operation Monitoring	\$34,004					
Reading Comp	\$36,471					
Repairing	\$33,693					
Time Management	\$36,969					
Trouble Shooting	\$36,062					
Considered a Critical Skill for this occup.						

Location of Shortages

Not Available/Not Included

Emerging Industries/Occupations

- The number of Respiratory Therapists and Respiratory Technicians is projected to grow 54% from 2002 to 2012.

Significance/Impact:

- Nearly 20% of the ERG 7 population does not possess a high school diploma or GED. Without some sort of program to increase the skills of this population in the near future there will potentially be a large number of unfilled skilled job openings.
- While the focus on this report was primarily on manufacturing, it is noted that these skill shortage issues will create a demand for skilled individuals in the region by virtually every other industry sector as well.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 8

Excerpts from Shortage Report

- Manufacturing has the largest share of jobs at 15.9%
- Healthcare is expanding and is now up to 11.7% of the jobs in this region.
- Hospitality & Tourism sector has a major impact on employment in every county in EGR 8 and makes up 11% of the region's total employment.
- Construction industry is growing but deemed a lesser priority due to the availability of various union apprentice programs.

Key Industries: Manufacturing, Health Care, Professional, Scientific, and Technical Services and Hospitality

- Food Manufacturing such as Animal Slaughtering and Processing (NAICS 311)
- Plastics and Rubber Manufacturing (NAICS 326)
- Ambulatory Health Care Services (NAICS 621) and Hospitals (NAICS 622)

Key Occupations (based on top 5 shortage projections):

Team Assemblers: Work as part of a team having responsibility for assembling an entire product or component of a product. Able to perform all tasks conducted by team on a rotating basis.

Registered Nurses: Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients.

Electrical and Electronic Engineering Technicians: Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components.

Nurses Aides, Orderlies and Attendants: Provide basic patient care under direction of nursing staff. Perform duties, such as feed, bathe, dress, groom, or move patients, or change linens.

Respiratory Therapists: Assess, treat, and care for patients with breathing disorders. Assume primary responsibility for all respiratory care modalities, including the supervision of respiratory therapy technicians. Initiate and conduct therapeutic procedures; maintain patient records; and select, assemble, check, and operate equipment.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Team Assemblers	234
Registered Nurses	191
Electrical and Electronic Engineering Technicians	134
Nurses' Aides, Orderlies and Attendants	59
Respiratory Therapist	26

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

Service Orientation — Actively looking for ways to help people.

Trouble Shooting — Determining causes of operating errors and deciding what to do about it.

Overlapping Critical Skills For Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Team Assembler	Registered Nurses	Electrical Eng. Tech	Nurses Aides	Respiratory Therapist
Critical Thinking	\$44,225					
Troubleshooting	\$42,914					
Monitoring	\$41,814					
Coordination	\$41,326					
Reading Comprehension	\$38,631					
Time Management	\$38,062					
Instructing	\$36,776					
Speaking	\$35,044					
Service Orientation	\$34,016					
Active Listening	\$31,436					
Considered a Critical Skill for this occup.						

Location of Shortages (all critical occupations included)

Not Available/Not Included

Emerging Industries/Occupations

- Professional, Scientific, and Technical Services and Hospitality
- Healthcare will continue to lead the region in job creation

Significance/Impact:

- Employers were willing to provide training on specific work-related duties. However they cite work readiness issues such as poor attendance, punctuality and lack of commitment as obstacles in finding quality workers. They do not have the resources or time available to train workers in basic skills such as reading and writing.
- The quality of the workforce has an economic impact, regardless of the occupation or industry. IBRC survey of Bloomington employers found the quality and availability of workforce are "two most important local factors related to business success."

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 9

Excerpts from Shortage Report

- Manufacturing makes up 28.5% of the EGR 9 employment, but lost over 1,500 jobs in the 1994-2004 decade.
- Healthcare and Social Services make up 10.7% of EGR 9 employment.
- "Universal concern" exists about the level of basic skills in the region's workforce.
- Need to upgrade skills at all levels to increase flexibility, multi-tasking and innovation.

Key Industries:

- Employment in the Arts, Entertainment, and Recreation sector (713) is growing in Dearborn, Ohio and Switzerland counties.
- Transportation Equipment Manufacturing (336).
- Ambulatory Health Care Services (621).

Key Occupations (based on top 5 shortage projections):

Registered Nurses – Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management. Licensing or registration required. Includes advance practice nurses such as: nurse practitioners, clinical nurse specialists, certified nurse midwives, and certified registered nurse anesthetists. Advanced practice nursing is practiced by RNs who have specialized formal, post-basic education and who function in highly autonomous and specialized roles.

Licensed Practical Nurses - Care for ill, injured, convalescent, or disabled persons in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse. Licensing required.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 - 2007
Registered Nurses	52
Licensed Practical Nurses	45

Selected Skills Definitions

Active Learning — Understanding the implications of new information for both current and future problem-solving.

Monitoring — Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

Social Perceptiveness -- Being aware of others' reactions and understanding why they react as they do.

Critical Skills For Registered and Licensed Practical Nurses, with Associated Wage

Skill	Assoc. Wage
Judgment/Decision Making	\$56,508
Active Learning	\$51,256
Science	\$50,957
Monitoring	\$47,618
Critical Thinking	\$46,657
Coordination	\$43,879
Writing	\$43,852
Social Perceptiveness	\$43,202
Reading Comprehension	\$40,176
Time Management	\$39,615
Learning Strategies	\$39,090
Instructing	\$38,482
Speaking	\$38,367
Service Orientation	\$35,343
Active Listening	\$33,862

Location of Shortages

Not Available/Not Included

Emerging Industries/Occupations

- Chemical Manufacturing (325) is cited as an emerging industry
- Healthcare has "13 of the fastest 20 growing occupations by percentage."
- Transportation and Warehousing (48-49)

Significance/Impact:

- Taking action to address skill shortages is critical for this EGR. Labor shortages will continue due to an increase in the 65-and-above age group and a decrease of 36% in the college age group (18-24) Overall Labor Force (18-64) will increase less than 1% over next decade.
- Aging population will put demands on health care industry to keep pace with skilled workers

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 10

Excerpts from Shortage Report

- Despite recent job losses, manufacturing remains the largest employer in EGR 10 with 21% of the total employment.
- The Healthcare industry had the largest job growth from 2001 to 2004 with an increase of 988 jobs.

Key Industries:

- Healthcare, experiencing an across-the-board increase.
- Manufacturing, where growing industries include Wood Products (NAICS 321) and Computer & Electronic Products Manufacturing (NAICS 334).
- Logistics (NAICS 484).

Key Occupations (based on top 5 shortage projections):

Truck Drivers- CDL (Heavy Tractor Trailer: Drive a tractor-trailer combination or a truck with a capacity of at least 26,000 GVW, to transport and deliver goods, livestock, or materials in liquid, loose, or packaged form. May be required to unload truck. May require use of automated routing equipment. Requires commercial drivers' license.

Production Workers, Other: All production workers not listed separately.

Welders, Cutters, Solderers & Brazers: Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

First-Line Supervisors/Managers of Production: Supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.

Respiratory Therapists: Assess, treat, and care for patients with breathing disorders. Assume primary responsibility for all respiratory care modalities, including the supervision of respiratory therapy technicians. Initiate and conduct therapeutic procedures; maintain patient records; and select, assemble, check, and operate equipment.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection 2005 -2007
Truck Drivers –CDL (Heavy Tractor-Trailer)	195
Production Workers –Other	139
Welders, Cutters, Solderers & Brazers	39
First-Line Supervisors/Managers of Production	35
Respiratory Therapists	27

Selected Skills Definitions

Coordination — Adjusting actions in relation to others' actions.

Operation & Control — Controlling operations of equipment or systems.

Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.

Overlapping Critical Skills For Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Truck Drivers	Welders Solderers	First Line Supervisors	Respiratory Therapist
Critical Thinking	\$44,328				
Coordination	\$42,188				
Time Management	\$37,854				
Reading Comprehension	\$37,836				
Speaking	\$36,503				
Operation Monitoring	\$30,449				
Operation & Control	\$28,924				
Considered a Critical Skill for this occupation					

Location of Shortages

Not Available/Not Included

Emerging Industries/Occupations

- Logistics is an industry with “enormous potential” in EGR 10 and the need for Truck Drivers is increasing.

Significance/Impact:

- If skill gap issues are not addressed, employers in the region fear more employment being moved to China and other countries
- The current trained workforce is aging and needs a new generation of skilled employees to replace this group.

Strategic Skills Initiative Occupational & Skills Shortage Report Summary Economic Growth Region 11

Excerpts from Shortage Report

- Although manufacturing jobs overall are fewer than they were several years ago, much of the reduced employment is due to increased productivity, new technology, and lean manufacturing practices.
- The industries with the greatest increase in jobs from 2000 to 2004 were:
 - Management of Companies & Enterprises, which added 1,065 jobs (34.4% increase for the period)
 - Mining, which added 418 jobs (27.1% increase)
 - Arts, Entertainment & Recreation, which added 382 jobs (13.0% increase)
 - Health Care & Social Services, which added 1,687 jobs (6.9% increase)
- The Transportation Equipment sector continues to be a focus of economic development in the region as Toyota continues to draw Parts and Equipment suppliers to develop production capacity in the region.

Key Industries: Mining (Mining, except oil and gas); Manufacturing (Transportation Equipment, Furniture and Related Products, Plastics & Rubber Products, Chemicals); Utilities; and Health Care (Ambulatory Health Care and Hospitals)

- Mining (except oil and gas) has regional interest due to significant Mining activities in the Northern part of the region. This subsector accounted for 1,766 of the 1,958 jobs in the sector in 2004.
- The Transportation Equipment Manufacturing subsector has experienced an 84.8% increase in wage earning jobs between 2000 and 2004. The next highest growth subsector was Plastic & Rubber Product Manufacturing, with a 4.0% increase in wage-earning jobs over the same period.

Key Occupations (based on top 5 shortage projections):

Maintenance and Repair Workers: Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair.

Registered Nurses: Assess patient health problems and needs, develop and implement nursing cares plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

Licensed Practical Nurses: Care for ill, injured, convalescent, or disabled persons in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse. Licensing required.

Industrial Machinery Mechanics: Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems.

Maintenance Workers, Machinery: Lubricate machinery, change parts, or perform other routine machinery maintenance.

Net Calculation Table (top 5 shortages) – Includes Demand, Supply & Migration

Occupation	Shortage Projection-> 2007
Maintenance and Repair Workers	94
Registered Nurses	39
Licensed Practical Nurses	37
Industrial Machinery Mechanics	10
Maintenance Workers, Machinery	4

Selected Skills Definitions

Coordination — Adjusting actions in relation to others' actions.

Operation and Control — Controlling operations of equipment or systems.

Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

Overlapping Critical Skills for Top 5 Shortage Occupations with Associated Wage

Skill	Assoc. Wage	Maint. & Repair Wkrs	RN	LPN	Machine Mechanics	Mach. Maint.
Judgment/Decision Making	\$53,232					
Active Learning	\$48,545					
Science	\$47,761					
Critical Thinking	\$45,309					
Monitoring	\$44,572					
Coordination	\$43,005					
Writing	\$42,347					
Social Perceptiveness	\$41,137					
Time Management	\$39,654					
Reading Comprehension	\$39,290					
Instructing	\$38,884					
Learning Strategies	\$38,433					
Troubleshooting	\$38,362					
Speaking	\$37,731					
Equipment Selection	\$37,205					
Repairing	\$36,811					
Service Orientation	\$36,352					
Operation Monitoring	\$33,468					
Active Listening	\$33,092					
Equipment Maintenance	\$31,725					
Considered a critical skill for this occupation						

Emerging Occupations

- Medical Imaging Technicians
- Pharmacy Technicians
- Respiratory Therapists

Significance/Impact:

- Shortages of qualified workers in Industrial Maintenance will make it increasingly difficult to attract component parts suppliers, which will limit future expansion and economic growth of the region.
- The shortage of RNs in hospitals has an effect on the quality of care that hospitals are able to provide. Without adequate staffing levels there is an increased risk of error by the nurses as they cover a greater number of



patients and work longer hours.